The Description and Classification of Vegetation. By David M. Shimwell. xiv + 322 pp., 70 figs., 68 tables. Univ. of Washington Press, Seattle, and Sidgwick and Johnson, London. 1971. $10.50.

Description of vegetation is an ecological tool, for all describers of vegetation have been interested in ecological relationships. The reverse is by no means true; nor is interest in other branches of botany, the botany of individual plants, for example, such as floristics, physiology, or morphology, a guarantee that the investigator will make the primary assumption of an ecological relationship between the phenomena he describes and the environment in which the phenomena are produced.

Classification becomes necessary in science just as soon as enough descriptive data are collected to make possible, and necessary, fruitful discussion and comparison, contructive criticism, and teaching (to paraphrase Pallmann). We evidently have enough descriptive data on vegetation now, since in fact for many areas there exist several vegetation classifications.

Shimwell's book is thus timely and valuable. However, it was written and published in Britain, for a British audience, using British examples, with attention to problems of British vegetation. This is not bad, only different. It does give a warped view of the subject. Still, British work on plant ecology has been outstanding and abundant. Work in floristics, history, many aspects of autecology, competition, experimental ecology, vegetation survey, pattern analysis, statistical methods applied to classification and ordination, and integration with soil properties is well-treated in Shimwell's book.

However, I think several concepts are not clearly presented. Chapter 1 on "Quantitative description of species populations" should be looked at logically and compared with similar material in other textbooks. Probably there *is* no operational definition of a species population. Shimwell's definition of an ecosystem is also non-operational, however beguilingly phrased in terms of niches. Quantitative methods of analyzing vegetation need systematization. I would prefer a system based on the properties measured: weight, cover, density, site index, layering, vitality, etc., with clear recognition of what the numbers attached to these parameters mean. Such non-absolute "measures" as frequency and importance value are then immediately seen to be expressed in peculiar units. Specifically any "point" method of recording the composition (cover, density?) of vegetation records frequency if the "point" has area (cf. Hutchings and Holmgren in Ecology 40(4):668–677, 1959). Additional useful methods should have been drawn from applied plant ecology–forestry, range management, agronomy.

Chapter 2 on units of vegetation classification traces genealogies of concepts such as association and formation in various local "traditions". Surely there is a modicum of agreement on these concepts now. Shimwell throughout his book emphasizes the plethora of opinions held by individual plant ecologists. More critical analysis of, or more selectivity among, these opinions would have been welcome. And to localize genealogies of ideas in this way is to peer into people's thoughts, conversations, reading, and to deny that a science is really a reticulate community.

Vegetation can be described and classified physiognomically, functionally, structurally, genetically, and floristically, and chapters are devoted to these methods. I would agree with the associates of Braun-Blanquet who point out that floristic knowledge leads into the other methods, but not vice versa. The others have what looks like a distinct advantage in requiring less botanical knowledge, but this is obviously a contradiction since vegetation is composed of plants. They also allow, even demand, the formation of deductive schemes of relationships. Such schemes are a very mixed blessing as Clements' successional straitjacket for American vegetation has shown. Shimwell gives a good presentation of the Braun-Blanquet methods, and this part of the book is extremely valuable. Perhaps it will lead to the simple and basic realization that data on vegetation must be collected systematically to describe any system of vegetation.

The next chapter on vegetation gradients and continua should have been tied to the preceding one on the Braun-Blanquet system. Both the collection and presentation of data that are subsequently arranged into continua have been poor. The data cannot be re-arranged. The best documented continua or gradients or ecological series of functional relationships are in work done by the Braun-Blanquet people or by the Russians. Shimwell neglects the Russian work completely, and no more serious mistake in vegetation description and classification could be made. The ecological series documented by Aleksandrova, Sukachev, Ramensky, Wendelberger, Braun-Blanquet himself, Gjaerevoll–to name only a few the reviewer has found useful in teaching–well illustrate vegetation as a factorial function of environmental factors.

Any new book treating the ecology of vegetation is useful. Shimwell's book is no exception. The field is multifarious, expanding rapidly, and there is no consensus on methods, techniques, even goals. Most techniques have not been tested widely. Shimwell's book makes teaching and learning the subject easier. It provides a convenient reference for students. It is not the only text a beginning student should have access to.–Jack Major, Botany Department, University of California, Davis 95616.

Annual Review of Ecology and Systematics. By Richard F. Johnston, Peter W. Frank, and Charles D. Michener, Eds. Vol. 2, 1971. iv + 510 pp. Annual Reviews Inc., Palo Alto. $10.

The general reader will be most pleased with this volume, the second in a projected series. On the other hand, plant systematists may find most of the "reviews" of only peripheral interest. The diffuse subject matter of this volume demonstrates the futility of attempting a review of such diverse fields as ecology and systematics and still have a product palatable to either specialty. To place together in one volume articles with titles as divergent as "The sacred in human evolution", and "High-latitude phytoplankton", will either broaden one's reading range or allow one to decide that the few pertinent articles do not justify the purchase of the book and especially not the whole series. Perhaps this difficulty could be alleviated by tailoring alternate volumes for particular readerships.

Among the 19 papers in this issue, 4 contained information of special interest to this reviewer. These were "Adaptive radiation of reproductive characteristics in angiosperms, II: seeds and seedlings" by G. Ledyard Stebbins; "The karyotype in systematics" by Ray C. Jackson; "Arctic and alpine plant life cycles" by Lawrence C. Bliss; and "Seed predation by animals" by Daniel H. Janzen. These are the articles most allied to higher plant systematics, but one is immediately aware from the titles alone, that they are hardly in the main stream of systematic botany.

Stebbins' article is the second in a series that illustrates his thesis that the characters employed by evolutionary biologists in deducing relationships and in erecting systems of classification are expressions of adaptation to particular environmental pressures, and not products of orthogenesis. Seeds and seedlings are crucial stages in the life histories of plants where integration and coordination of morphogenetic events, physiological processes, and morphological form are indispensable and where selection is likely to have a strong influence in molding unique qualities of populations. Successful reproduction and establishment often present conflicting demands upon the organism so that evolutionary compromises, for example, between seed size and number, often result. The adaptive significance of many properties of seeds and seedlings is pointed out based upon gleanings from the meager scattered literature and made cohesive with numerous personal observations by the author.

While Stebbins' paper utilizes only a modest bit of the biological literature, Jackson marshals 174 mostly recent references to update karyotype study as applied to systematics. Only a few years ago one could ascertain the karyotype of an organism by counting the chromosomes, measuring their relative and absolute arm lengths,